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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,076	RUBIN ET AL.	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/08/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed July 08, 2009 ("Arguments") have been fully considered but they are not persuasive. Applicant states, on page 3 of the Arguments, "Accordingly, contrary to the Office's allegation, Cahill merely teaches that the distance between the two opposite surfaces, not a coating, may be as small as 10 nm." However, Cahill states, "One or both said surfaces may comprise a coating of buffering molecules" and "In preferred embodiments of the invention the generation of these extremely small distances permits the pH of the aqueous medium to be determined by buffering molecules immobilized on the surface of the chamber." See paragraph [0010]. If the distance between the opposite surfaces may be as small as 10 nm and "[o]ne or both said surfaces may comprise a coating of buffering molecules" it necessarily follows that the coating may be 10 nm or less. How the coating be thicker than the space the that contains it?

Applicant also states, "Cahill does not implicitly disclose separating coatings." However, the coating in Cahill forms a pH gradient so that isoelectric focusing may be performed, as does Applicant. See paragraphs [0001], [0007], [0009], and [0011] in Cahill and page 6, last paragraph to the end of page 7 in Applicant's specification. Thus, Cahill discloses separating coatings.

Applicant faults Cahill for not disclosing various structural features required by claim 1 (bottom of page 3 of Arguments); however, Cahill is only used in the rejections as a secondary reference to show that pH gradients with a thickness of between 0.01-15 μm were known at the time of the invention. So to make the pH gradient in Wiktorowicz 0.01-15 μm is mere substitution of one known element for another to obtain predictable results. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In Applicant's remaining arguments against the rejections based on Liu in view of Zanzucchi, Simpson and Cahill; and Lee in view of Zanzucchi, Simpson, and Cahill, Applicant reiterates his initial arguments against Cahill. The Examiner in turn relies on his rebuttal above.

For the reasons set forth above the rejections are maintained.

Status of the rejections pending since the Office action of April 08, 2009

2. All previous rejections are maintained. They are restated below for Applicant's convenience. A sentences has been added to several of the rejections stating the 10 – 1000 nm and 10 – 500 nm are equal to 0.01 - 1.00 μm and 0.01 – 0.50 μm, respectively.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wiktorowicz et al. US 6,214,191 B1 ("Wiktorowicz") in view of Zanzucchi et al. US 5,755,942 ("Zannzucchi") and Simpson et al. US 6,143,152 ("Simpson"), and Cahill et al. EP 1044716 A1 ("Cahill").

Wiktorowicz discloses a micro fluid biomolecule separation system (abstract) comprising a primary separating path (160) and one or more secondary process paths (170), said primary separating path being in the form of a separating coating carried on a substrate (col. 06:61-67 and col. 10:01-08), wherein said separating coating comprising one or more separating layers (col. 10:01-08), at least one separating layer consisting of or comprises one or more pH active components comprising pH active

groups defined as chemical groups that are capable of being protonated or deprotonated in aqueous environments (col. 06:61-67 and col. 10:01-08), said fluid biomolecule separation system comprises means for applying a voltage over the primary separating path (col. 07:35-52), the or each secondary process path(s) comprising one or more inlets in liquid communication with the primary separating path, said one or more inlets being placed along or extends along the primary separating path (note inlets for microchannels 170 along upper edge 126a), whereby biomolecules separated along the primary path is capable of being introduced into the secondary process path(s) for being processed further (col. 07:47-54).

. Wiktorowicz does not mention (1) the thickness of the separating coating, and (2) having the system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre.

As for the claimed coating thickness range it should be first noted that the separating coating in Wiktorowicz may be an isoelectric focusing pKa gradient. See col. 06:61-67; col. 06:06-14; and col. 09:58 – col. 10:25. Cahill discloses isoelectric focusing pKa gradient coatings for use in electrophoresis microchannels. See the abstract. The coatings disclosed by Cahill may be used in microchannels having a height of only 10 nm. See paragraphs [0010] and [0020]. Since Cahill states, "The distance between the surfaces is typically between 10 and 1000 nm [0.01 – 1.00 μm], especially between 10 and 500 nm [0.01 – 0.50 μm]" and "One or both surfaces may comprise a coating of buffering molecules" (paragraph [0010]), Cahill thus implicitly discloses separating coatings with a thickness between 0.01 and 15 μm. Therefore,

Cahill implicitly discloses separating coatings with a thickness between 0.01 and 15 µm. Thus, in light of Cahill to use isoelectric focusing coatings having a thickness between 0.01 and 15 µm is merely simple substitution of one known element for another to obtain predictable results. Moreover, an advantage of the separating coatings Cahill discloses is that they avoid material losses that occur in other types of pH gradients due to solid pH barriers formed in gels and membranes. See [0006].

As for having the system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre, Wiktorowicz has the system in the form of a disc device begin essentially rectangular comprising a centre, the microchannel structure being arranged around the centre. See Figures 3 and 4. Changing the shape of the disc form rectangular to circular is a mere matter of choice that has no effect on the operation of the device. MPEP 2144.04.IV.B. Moreover as shown by Simpson and Zanzucchi it was known at the time of the invention to have a microfluidic system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre. See Figure 1 in Simpson and Figure 1B in Zanzucchi. Thus, the substitution of a circular disc for a rectangular disc is also simple substitution of one known element for another to obtain predictable results.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. US 6,676,819 B1 ("Liu"), Zanzucchi et al. US 5,755,942 ("Zannzucchi"), Simpson et al. US 6,143,152 ("Simpson"), and Cahill et al. EP 1044716 A1 ("Cahill").

Liu discloses a micro fluid biomolecule separation system (abstract and col. 01:34-44) comprising a primary separating path (14) and one or more secondary process paths (60), said primary separating path being in the form of a separating coating carried on a substrate (col. 10:60 – col. 11:26), wherein said separating coating comprising one or more separating layers (col. 10:60 – col. 11:26), at least one separating layer consisting of or comprises one or more pH active components comprising pH active groups defined as chemical groups that are capable of being protonated or deprotonated in aqueous environments (col. 10:60 – col. 11:26 and col. 02:30-60), said fluid biomolecule separation system comprises means for applying a voltage over the primary separating path (col. 10:18-30 and col. 13:01-09), the or each secondary process path(s) comprising one or more inlets in liquid communication with the primary separating path, said one or more inlets being placed along or extends along the primary separating path (note inlets for microchannels 60 especially in Figures 5, 6, 8, 9A, 9B, and 10-12), whereby biomolecules separated along the primary path is capable of being introduced into the secondary process path(s) for being processed further (col. 13:15-30 and col. 14:05-15).

As for the claimed coating thickness range it should be first noted that the separating coating in Liu may be an isoelectric focusing pKa gradient. See

Col. 11:11-26. Cahill discloses isoelectric focusing pKa gradient coatings for use in electrophoresis microchannels. See the abstract. The coatings disclosed by Cahill may be used in microchannels having a height of only 10 nm. See paragraphs [0010] and [0020]. Since Cahill states, "The distance between the surfaces is typically between 10 and 1000 nm [0.01 – 1.00 μm], especially between 10 and 500 nm [0.01 – 0.50 μm]" and "One or both surfaces may comprise a coating of buffering molecules" (paragraph [0010]), Cahill thus implicitly discloses separating coatings with a thickness between 0.01 and 15 μm. Therefore, in light of Cahill to use isoelectric focusing coatings having a thickness between 0.01 and 15 μm is merely simple substitution of one known element for another to obtain predictable results. Moreover, an advantage of the separating coatings Cahill discloses is that they avoid material losses that occur in other types of pH gradients due to solid pH barriers formed in gels and membranes. See [0006].

As for having the system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre, Liu has the system in the form of a disc device begin essentially rectangular comprising a centre, the microchannel structure being arranged around the centre. See Figures 3 and 4. Changing the shape of the disc form rectangular to circular is a mere matter of choice that has no effect on the operation of the device. MPEP 2144.04.IV.B. Moreover as shown by Simpson and Zanzucchi it was known at the time of the invention to have a microfluidic system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the

centre. See Figure 1 in Simpson and Figure 1B in Zanzucchi. Thus, the substitution of a circular disc for a rectangular disc is also simple substitution of one known element for another to obtain predictable results.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. US 6,974,526 B2 ("Lee"), Zanzucchi et al. US 5,755,942 ("Zannzucchi"), Simpson et al. US 6,143,152 ("Simpson"), and Cahill et al. EP 1044716 A1 ("Cahill").

Lee discloses a micro fluid biomolecule separation system (abstract) comprising a primary separating path (3) and one or more secondary process paths (4), said primary separating path being in the form of a separating coating carried on a substrate (col. 05:45-50 and claims 2 and 9), wherein said separating coating comprising one or more separating layers (col. 10:60 – col. 11:26), at least one separating layer consisting of or comprises one or more pH active components comprising pH active groups defined as chemical groups that are capable of being protonated or deprotonated in aqueous environments (col. 10:60 – col. 11:26), said fluid biomolecule separation system comprises means for applying a voltage over the primary separating path (col. 04:21-24), the or each secondary process path(s) comprising one or more inlets in liquid communication with the primary separating path, said one or more inlets being placed along or extends along the primary separating path (see Figures 2-9), whereby biomolecules separated along the primary path is capable of being introduced into the secondary process path(s) for being processed further (col. 02:01-19 and claim 7).

As for the claimed coating thickness range it should be first noted that the separating coating in Liu may be an isoelectric focusing pKa gradient. See col. 05:45-50 and claims 2 and 9. Cahill discloses isoelectric focusing pKa gradient coatings for use in electrophoresis microchannels. See the abstract. The coatings disclosed by Cahill may be used in microchannels having a height of only 10 nm. See paragraphs [0010] and [0020]. Since Cahill states, "The distance between the surfaces is typically between 10 and 1000 nm [0.01 – 1.00 μm], especially between 10 and 500 nm [0.01 – 0.50 μm]" and "One or both surfaces may comprise a coating of buffering molecules" (paragraph [0010]), Cahill thus implicitly discloses separating coatings with a thickness between 0.01 and 15 μm. Therefor, Cahill implicitly discloses separating coatings with a thickness between 0.01 and 15 μm. Thus, in light of Cahill to use isoelectric focusing coatings having a thickness between 0.01 and 15 μm is merely simple substitution of one known element for another to obtain predictable results. Moreover, an advantage of the separating coatings Cahill discloses is that they avoid material losses that occur in other types of pH gradients due to solid pH barriers formed in gels and membranes. See [0006].

As for having the system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre, Lee has the system in the form of a disc device begin essentially rectangular comprising a centre, the microchannel structure being arranged around the centre. See Figures 3 and 4. Changing the shape of the disc form rectangular to circular is a mere matter of choice that has no effect on the operation of the device. MPEP 2144.04.IV.B.

Moreover as shown by Simpson and Zanzucchi it was known at the time of the invention to have a microfluidic system be in the form of a disc device begin essentially circular comprising a centre, the microchannel structure being arranged around the centre. See Figure 1 in Simpson and Figure 1B in Zanzucchi. Thus, the substitution of a circular disc for a rectangular disc is also simple substitution of one known element for another to obtain predictable results.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Alex Noguerola/
Primary Examiner, Art Unit 1795
July 20, 2009